

CLAIMS

What is claimed is:

1. A method of determining spatial information about specific molecular contrast agents in a sample comprising the steps of:
  - 5 (a) stimulating, at a plurality of intensity levels, the sample thereby altering an optical property of the molecular contrast agent;
  - (b) acquiring a plurality of optical coherence tomography (OCT) images, at least some of the plurality of OCT images being acquired at different stimulus intensities; and
  - 10 (c) profiling the molecular contrast agent concentration distribution based on the plurality of OCT images.
2. The method of claim 1, wherein the stimulation intensity levels provide transient changes in the optical property of the molecular contrast agent.
3. The method of claim 1, wherein at least some of the stimulation intensity 15 levels provide saturation of the optical property of the molecular contrast agent.
4. The method of claim 1, wherein stimulating the molecular contrast agent increases the optical absorption of the agent.
5. The method of claim 1, wherein stimulating the molecular contrast agent 20 increases the optical transparency of the agent.
6. The method of claim 1, wherein stimulating the sample is performed using light at one wavelength and acquiring the images is performed using light at another wavelength.

7. The method of claim 1, wherein stimulating the sample is performed using light at the same wavelength as the light used for acquiring the images.
8. The method of claim 7, wherein the phase of light used for stimulating the sample is different than the phase of light used for acquiring the images.
9. The method of claim 1, wherein acquiring the images is performed after stimulating the sample.
10. The method of claim 1, wherein acquiring the images is performed while stimulating the sample.
11. The method of claim 1, wherein profiling the molecular contrast agent concentration includes comparing OCT images acquired with the stimulation source active to those acquired with the stimulation source inactive.
- 15 12. The method of claim 1, wherein profiling the molecular contrast agent concentration includes comparing OCT images acquired at different intensities of stimulation.